may be divided into sectors, but such a scenario is not illustrated in greater detail in order to keep the focus on the invention.

[0024] The base station **100** may be configured to provide communication services according to at least one of the following communication protocols: Worldwide Interoperability for Microwave Access (WiMAX), Universal Mobile Telecommunication System (UMTS) based on basic wideband-code division multiple access (W-CDMA), high-speed packet access (HSPA), long-term evolution (LTR), and/or LTE advanced (LTE-A). The base station **100** may additionally provide the second generation cellular services based on GSM (Global System for Mobile communications) and/or GPRS (General Packet Radio Service). The present invention is not, however, limited to these protocols.

[0025] The base station **100** may be used by multiple network operators in order to provide radio coverage from multiple operators to the cell **100**. The base station **100** may be a node a, an evolved node B (eNB) as in LTE-A, a radio network controller (RNC), or any other apparatus capable of controlling radio communication within the cell **102**.

[0026] For the sake of simplicity of the description, let us assume that the base station **100** is an eNB. The development of E-UTRAN is concentrated on the eNB **100**. All radio functionality is terminated here so that the eNB is the terminating point for all radio related protocols. The E-UTRAN may be configured such that an orthogonal frequency division multiple access (OFDMA) is applied in downlink transmission, whereas a single carrier frequency division multiple access (SC-FDMA) may be applied in uplink, for example. In the case of multiple eNBs in the communication network, the eNBs may be connected to each other with an X2 interface as specified in the LTE.

[0027] The eNB **100** may be further connected via an SI interface to an evolved packet core (EPC) **110**, more specifically to a mobility management entity (MME) and to a system architecture evolution gateway (SAE-GW). The MME is a control plane for controlling functions of non-access stratum signaling, roaming, authentication, tracking area list management, etc., whereas the SAE-GW handles the user plane functions including packet routing and forwarding, E-UTRAN idle mode packet buffering, etc. The user plane bypasses the MME plane directly to the SAE-GW. The SAE-GW may comprise two separate gateways: a serving gateway (S-GW) and a packet data network gateway (P-GW). The MME controls the tunneling between the eNB and the S-GW, which serves as a local anchor point for the mobility between different eNBs, for example. The S-GW may relay the data between the eNB and the P-GW, or buffer data packets if needed so as to release them after an appropriate tunneling is established to a corresponding eNB. Further, the MMEs and the SAE-GWs may be pooled so that a set of MMEs and SAE-GWs may be assigned to serve a set of eNBs. This means that an eNB may be connected to multiple MMEs and SAE-GWs, although each user terminal is served by one MME and/or S-GW at a time.

[0028] Referring to FIG. **1**, the cell **102** is associated with the base station **100** controlling communications within the cell **102**. The base station **100** may control a cellular radio communication link established between the base station **100** and terminal devices **112** to **114** located within the cell **102**. A conventional communication link for end-to-end communication is such where the source device transmits data to the destination device via the base station **100**. That is, radio communication links **116** and **118** are established between the terminal device **112** and the base station **100**, and between the terminal device **114** and the base station **100**, respectively. Therefore, the user terminals **112**, **114** may communicate with each other via the base station **100**.

[0029] According to an embodiment, device-to-device (D2D) connections may be established among terminal devices. Communication links between two devices are established, e.g., between terminal devices **120** and **122** in FIG. **1**. A D2D communication link **124** may be based on any radio technology such that the terminal devices **120** and **122** involved in the communication may apply communication according to any of a plurality of radio access technologies.

[0030] The eNB **100** may be responsible for controlling the communication link **124**, as shown with dashed lines in FIG. **1**. The radio access technology of the direct communication link **124** may operate on the same frequency band as the conventional communication link and/or outside those frequency bands to provide the arrangement with flexibility. Thus, the base station **100** may be responsible for allocating radio resources to the communication link **124** as well as for the conventional communication links **116** and **118**. For example, the cellular network may operate in FDD duplex mode and the D2D communication link **124** may apply TDD duplex mode utilizing uplink, downlink or uplink and downlink radio resources of the cellular network under the control of the base station **100**. Thus, the direct communication link may use the same networking protocols as of the supporting cellular system. The nodes **112**, **114**, **120** and **122** may be static or dynamic. This means that the nodes, such as user terminals, user equipment, palm computers or any apparatuses capable of operating in a communication network, may stay still or they may be moving, as shown with a reference numeral **113** in FIG. **1**. Let us consider the aspect of moving nodes later.

[0031] According to an embodiment, the user terminals **120** or **122**, also called as network nodes, notify their existence and properties when they wish to participate in an existing D2D network or establish a new D2D network. For this purpose they may broadcast a message notifying the existence of the node in the network. This is called as beaconing, i.e., the node **120** or **122** broadcasts an individual beacon receivable by any node **122** or **120** in the proximity of the node **120** or **122**, respectively. The node **120**, **122** may access a beacon channel, where the beacon channel denotes a group of resource elements designated for advertising the availability and a set of essential attributes of the node **120**, **122**. The transmissions of D2D beacon channels may be synchronized, having a predefined semi-static channel format and allocation schedule.

[0032] Given the possibility of having a huge number of nodes **120**, **122** even in one cell, each node **120**, **122** employing D2D communications selects its beacon channel for broadcasting such that the occurrence of collisions on the selected beacon channel is avoided as much as possible. Consequently, according to an embodiment, a node **120**, **122** capable of entering the D2D communication network, selects the channel for broadcasting from a set of channels dedicated for informing node properties in the D2D communication network, wherein the selection is based on at least one of the following: the characteristics of the node and the state of the node. The chosen channel may be called the selected beacon